

CLAIMS

1. An image display device comprising a plurality of gate buses, a plurality of source buses, transistors each of which for supplying a pixel electrode with a voltage from said source bus, a common electrode, and a corrected voltage supplying means for supplying said common electrode with a common electrode voltage which has been corrected by an amount of correction,

wherein said corrected voltage supplying means comprising:

a changing voltage generating means for generating a first changing voltage having changing voltage levels for setting said transistor to an on-state and a second changing voltage having changing voltage levels for setting said transistor to an off-state, said changing voltage generating means operating so as to establish at least three supply modes including a first supply mode, a second supply mode and a third supply mode, said first supply mode in which said first changing voltage is supplied to a first number of ones of said plurality of gate buses and said second changing voltage is supplied to a second number of ones of said plurality of gate buses, said second supply mode in which said first changing voltage is supplied to a third number of ones of said plurality of gate buses and said second changing voltage is supplied to a fourth number of ones of said plurality of gate buses or said first changing voltage is supplied to at least said third number of ones of said plurality of gate buses and said second changing voltage is not supplied to said plurality of gate buses, and said third supply mode in which said first changing voltage is supplied to a fifth number of ones of said plurality of gate buses and said second changing voltage is supplied to a sixth number of ones of said plurality of gate buses or said first changing voltage is not supplied to said plurality of gate buses and said second changing voltage is supplied to at least said sixth number of ones of said plurality of gate buses; and

a corrected voltage generating means for detecting, each time each of said at least three modes is established, a voltage on said common

electrode to determine said amount of correction on the basis of amounts of change in said detected voltages on said common electrode.

2. An image display device as claimed in claim 1, wherein said  
5 corrected voltage generating means comprises:

an AD converting means for detecting, each time each of said at least three modes is established, said voltage on said common electrode as an analog voltage to convert said detected analog voltages into first digital signals;

10 an operation means for determining amounts of change in said detected analog voltages from said first digital signals and determining said amount of correction on the basis of said determined amounts of change to output an digital signal representing said common electrode voltage which has been corrected by said determined amount of  
15 correction;

a DA converting means for converting said digital signal outputted from said operation means into an analog voltage, and

a switching means for switching between a first connection mode in which said common electrode is connected to said AD converting means  
20 and a second connection mode in which said common electrode is connected to said DA converting means.

3. A image display device as claimed in claim 2, wherein said  
25 corrected voltage generating means comprises a storing means for storing said corrected common electrode voltage represented by said digital signal outputted from said operation means,

and wherein said DA converting means converts said corrected common electrode voltage stored in said storing means into an analog voltage, instead of converting said digital signal outputted from said  
30 operation means into an analog voltage.

4. An image display device as claimed in any one of claims 1 to 3, wherein said corrected voltage supplying means comprises a

predetermined voltage generating means for generating a predetermined voltage to supply said source bus with said predetermined voltage,

and wherein said plurality of source buses are supplied with said predetermined voltage in each of said at least three supply modes.

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5. An image display device as claimed in claim 4, wherein said predetermined voltage generating means generates a constant voltage as said predetermined voltage.

10 6. An image display device as claimed in any one of claims 1 to 5, wherein said changing voltage generating means comprises:

a plurality of output circuits, each of which provided for a respective one of said plurality of gate buses, for selectively outputting an on-voltage of a constant value for setting said transistor to an on-state and  
15 an off-voltage of a constant value for setting said transistor to an off-state;

a signal generating circuits for generating a changing voltage signal which represents a predetermined changing voltage; and

a plurality of adders, each of which provided for a respective one of  
20 said output circuits, for adding said predetermined changing voltage to said on-voltage when said on-voltage is outputted from the corresponding output circuit to output said first changing voltage, and for adding said predetermined changing voltage to said off-voltage when said off-voltage is outputted from the corresponding output circuit to output said second  
25 changing voltage.

7. An image display device as claimed in claim 6, wherein said AD converting means detects said on-voltage and said off-voltage as an analog voltage and converts said detected analog voltage into a second  
30 digital signal,

and wherein said operation means determines said amounts of change from said first digital signal and values of said on-voltage and said off-voltage from said second digital signal, and determines said amount of

correction on the basis of said determined amounts of change and said determined values of said on-voltage and said off-voltage.

8. An image display device as claimed in any one of claims 1 to 7, wherein said changing voltage generating means operates so as to establish said at least three supply modes when a power supply of said image display device is turned from off to on.

9. An image display device as claimed in any one of claims 1 to 7, wherein said changing voltage generating means operates so as to periodically establish said at least three supply modes under the condition that a power supply of said image display device is in an on-state.

10. An image display device as claimed in any one of claims 1 to 9, wherein said at least three supply modes consists of only said first, second and third supply modes,

wherein said second supply mode is a mode in which said first changing voltage is supplied to all of said plurality of gate buses, and wherein said third supply mode is a mode in which said second changing voltage is supplied to all of said plurality of gate buses.

11. An image display device comprising a plurality of gate buses, a plurality of source buses, transistors each of which for supplying a pixel electrode with a voltage from said source bus, a common electrode, and a corrected voltage supplying means for supplying said common electrode with a common electrode voltage which has been corrected by an amount of correction,

wherein said corrected voltage supplying means comprising:  
a changing voltage generating means for generating a first changing voltage having changing voltage levels for setting said transistor to an on-state and a second changing voltage having changing voltage levels for setting said transistor to an off-state, said changing voltage generating means operating so as to establish at least three supply modes

including a first supply mode, a second supply mode and a third supply mode, said first supply mode in which said first changing voltage is supplied to a first number of ones of said plurality of gate buses and said second changing voltage is supplied to a second number of ones of said plurality of gate buses, said second supply mode in which said first changing voltage is supplied to a third number of ones of said plurality of gate buses and said second changing voltage is supplied to a fourth number of ones of said plurality of gate buses or said first changing voltage is supplied to at least said third number of ones of said plurality of gate buses and said second changing voltage is not supplied to said plurality of gate buses, and said third supply mode in which said first changing voltage is supplied to a fifth number of ones of said plurality of gate buses and said second changing voltage is supplied to a sixth number of ones of said plurality of gate buses or said first changing voltage is not supplied to said plurality of gate buses and said second changing voltage is supplied to at least said sixth number of ones of said plurality of gate buses;

a first detection terminal for detecting a voltage on said common electrode each time each of said at least three modes is established;

a storing means for storing said corrected common electrode voltage which is determined on the basis of amounts of change in said detected voltages on said common electrode through said first detection terminal; and

a DA converting means supplied with said corrected common electrode voltage stored in said storing means as a digital signal, said DA converting means converting said supplied digital signal into an analog voltage and outputting said analog voltage to said common electrode.

12. An image display device as claimed in claim 11, wherein said corrected voltage generating means comprises a switching means for switching between a first connection mode in which said common electrode is connected to said first detection terminal and a second connection mode in which said common electrode is connected to said DA converting means.

13. An image display device as claimed in claims 11 or 12,  
wherein said corrected voltage supplying means comprises a  
predetermined voltage generating means for generating a predetermined  
voltage to supply said source bus with said predetermined voltage,  
5 and wherein said plurality of source buses are supplied with said  
predetermined voltage in each of said at least three supply modes.

14. An image display device as claimed in claim 13, wherein said  
10 predetermined voltage generating means generates a constant voltage as  
said predetermined voltage.

15. An image display device as claimed in any one of claims 11  
to 14, wherein said changing voltage generating means comprises:  
15 a plurality of output circuits, each of which provided for a respective  
one of said plurality of gate buses, for selectively outputting an on-  
voltage of a constant value for setting said transistor to an on-state and  
an off-voltage of a constant value for setting said transistor to an off-  
state;  
20 a signal generating circuits for generating a changing voltage signal  
which represents a predetermined changing voltage; and  
a plurality of adders, each of which provided for a respective one of  
said output circuits, for adding said predetermined changing voltage to  
said on-voltage when said on-voltage is outputted from the corresponding  
25 output circuit to output said first changing voltage, and for adding said  
predetermined changing voltage to said off-voltage when said off-voltage  
is outputted from the corresponding output circuit to output said second  
changing voltage.

30 16. An image display device as claimed in claim 15, wherein said  
corrected voltage supplying means comprises a second detection terminal  
for detecting said on-voltage and a third detection terminal for detecting  
said off-voltage,

and wherein said storing means stores said corrected common electrode voltage which is determined on the basis of said amounts of change in said detected voltages on said common electrode through said first detection terminal, a value of said detected on-voltage through said second detection terminal, and a value of said detected off-voltage through said third detection terminal.

17. An image display device as claimed in any one of claims 11 to 16, wherein said at least three supply modes consists of only said first, second and third supply modes,

wherein said second supply mode is a mode in which said first changing voltage is supplied to all of said plurality of gate buses,

and wherein said third supply mode is a mode in which said second changing voltage is supplied to all of said plurality of gate buses.